

REMARKS/ARGUMENTS

Claims 5 and 8 - 10 have been cancelled without prejudice or disclaimer of the subject matter contained therein, applicants reserving the right to file one or more divisional applications.

Claims 1, 2, 4, 6, 7, 11, 12 and 13 are pending in the application. Claims 3, 5, 8, 9 and 10 have been cancelled.

Claims 12 and 13 have been amended.

With respect to the drawing objections, this has been obviated by the amendment to claim 13 deleting the objectionable language.

The rejection of claims 2 and 4 under 35 U.S.C. §112, first paragraph, is respectfully traversed. The Examiner contends that: "The disclosure as originally filed fails to disclose the fluidic oscillator as being a non-restrictor pressure reducer upstream of itself," and this is so: The non-restrictor pressure reducer is upstream of the fluidic oscillator. The Examiner has misinterpreted the language. Claim 2 recites a fluidic oscillator connected to a source of liquid under pressure and wherein the fluidic oscillator is from from a group of three fluidic oscillators:

"a multiple power nozzle oscillator, a reversing chamber oscillator, and a feedback oscillator...."

The claim then recites "and a non-restrictor pressure reducer upstream of said fluidic oscillator." With the word "and" interposed after the recitation of the third type of fluidic

oscillator is a further element and not a part of the listed selected of fluidic oscillator types.

The objection to claims 11 - 13 under 35 U.S.C. §112, second paragraph, has been obviated by the amendment to claim 12.

The objection to claim 13 has been avoided by deleting the admittedly confusing word "two-".

Prior Art Rejections

The rejection of claims 1, 6, 7, 11 and 12 under 35 U.S.C. §102(b) as being anticipated by Babich et al (US 4,205,786) (hereinafter "Babich) is respectfully traversed. Initially, it will be noted that this patent relates to "heat-power engineering and has particular reference to atomizing device...." (Col. 1, lines 1-2). The present invention is directed to a device for producing a spray of liquid droplets which project with a momentum such that the liquid droplets do not bounce off of a selected surface. Clearly, the Babich reference is not analogous art, does not deal with liquid droplets that do not bounce off of a selected surface and does not relate to spray liquid droplets as having low momentum and which are delivered to a surface or area without spray droplets bouncing off of a selected surface. See claims 1 and 2. Moreover, claim 1 recites a fluidic oscillator coupled to a supply of liquid under pressure and a vortex valve immediately upstream of said fluidic oscillator. This is not the case with Babich. In Babich, the swirl chamber 1 is provided with a nozzle and a pipe

running coaxially through the chamber and a nozzle into the zone of material atomization. The material to be atomized is fed through passage in channel A into pipe 4 and to outlet apertures 21. The second chamber 10 is an ultrasonic wave resonator. Obviously, the swirl chamber is not a vortex valve, and it is not upstream of a fluidic oscillator. In Babich, the swirl chamber is adapted to rotate the flow of and "atomizing gas." There is no fluidic oscillator coupled to a supply of liquid under pressure and a vortex valve immediately upstream of said fluidic oscillator.

A gas is not a liquid, and it does not form droplets. The droplets are formed by the atomization of the material fed through passage A.

In regard to claim 6, the reference has no fluidic oscillator having an input coupled to a supply of liquid under pressure and a vortex valve immediately upstream of the fluidic oscillator, said fluidic valve having an output which is connected to the input of the fluidic oscillator as recited in claim 6. Claim 7 calls for an oscillator coupled to a source of liquid for producing a liquid spray which spray droplets have a low momentum and allows for producing droplets of larger diameters and a selected range of diameters for similar operating pressures which is not disclosed in the reference. Claim 11 recites a device for producing droplets which adhere to a surface comprising "...means for reducing the velocity of spray droplets issuing from said fluidic spray nozzle so that said spray droplets have energy such that they do not

bounce off said surface." There is no teaching or suggestion of this function and result in the reference. It is not inherent therein.

In Babich and Nekrasov, liquid (fuel) to be atomized is fed into an ultrasonic oscillator wave field to break up the liquid into small droplets. In contrast, fluidic oscillators of the type specified in claim 2, for example, wave a liquid jet back and forth in ambient air to cause the jet of liquid to form the low momentum droplets.

Claim 12 depends from claim 11 and recites that the fluidic spray nozzle is selected from a low frequency multiple power nozzle oscillator such as shown in Figures 5 and 6 and a filter having a reversing chamber oscillator such as shown in Figure 3. No such device is disclosed in the reference.

The rejection of claims 1, 2, 4, 6, 7 and 11 - 13 under 35 U.S.C. §102(b) as being anticipated by Nekrasov et al (US 3,614,961) (hereinafter "Nekrasov") is respectfully traversed. The Examiner's rejection reads as follows:

Nekrasov discloses a fluidic spray system comprising a fluidic oscillator 2, 7 coupled to a supply of liquid A, B and a vortex valve 1.

As discussed above, Nekrasov is directed to an ultrasonic generator, its title reading: "Method of Generating Vibrations in the Sonic and Ultra-Sonic Frequency Ranges and Devices for Carrying Said Method into Effect." In the preamble to Nekrasov's specification, Nekrasov states:

This invention relates to ultrasonic vibration generators, and to a method of generating sonic and ultrasonic oscillations as well as to devices for carrying out this method.

This is hardly in applicant's field and is clearly not analogous art.

Moreover, the claims are not anticipated or made obvious by this reference.

Claim 1 recites a "fluidic oscillator coupled to a supply of liquid under pressure and a vortex valve immediately upstream of said fluidic oscillator." Nekrasov does not seek to provide liquid droplets projected with momentum such that they do not bounce off of a selected surface.

Nekrasov states:

It is common knowledge that a droplet size, either for liquid or for mixture of liquids dispersed with the aid of some gas or stream, depends upon the amplitude and frequency of vibrations imparted to a dispersed liquid and to a liquid and to a dispersing gas.

(Col. 4, lines 37 et seq.)

They state that the test ultrasonic fuel burner made according to their invention provides the dispersion of fuel to droplets less than 15 microns in size under a pressure of 4 to 6 atm. gauge for the fuel and of 4 to 4 atm. gauge for the dispersing agent (air or steam).

The present applicants do not seek to atomize as does Nekrasov and Babich.

While Nekrasov's resonators may be termed "fluid effect" devices, they are not fluidic spray systems and do not produce low

momentum liquid droplets projected with a momentum such that they do not bounce off of a selected surface. They do not appear to be coupled to a liquid supply in the manner defined by the claims, and there is no vortex valve immediately upstream and the fluid upstream of the fluidic oscillator. Claim 2 calls for a fluidic spray system for producing a liquid spray in which the spray droplets have a momentum which allows them to be delivered to a selected surface area without bouncing off and also calls for a multiple power nozzle fluidic oscillator, a reversing chamber oscillator, a feedback oscillator (all of which cause droplet formation by sweeping a liquid jet back and forth in the ambient) and a non-restrictor pressure reducer upstream of the fluidic oscillator. There is no such construction or teaching of this in the reference. An ultrasonic whistle is not a vortex valve upstream of a fluidic oscillator (claims 2 and 6), and an ultrasonic whistle and a supply of liquid for atomization is not a "non-restrictor pressure reducing means coupling a fluidic oscillator to a source of liquid (claims 7 and 11); and there is no disclosure in Nekrasov of a multiple power nozzle oscillator or a reversing chamber oscillator (claim 12). And, manifestly, Nekrasov does not disclose the molded chip structure recited in claim 13.

The rejection of claim 2 under 35 U.S.C. §102(e) is in error because Raghu (US 6,253,782) is not prior art. See 35 U.S.C. §103(c). This application and Patent No. 6,253,782 were copending and are owned by the same entity.

In view of the above, further and favorable reconsideration is respectfully requested.

Respectfully submitted,

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In the event this paper is deemed not timely filed, the applicant hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 26-0090 along with any other additional fees which may be required with respect to this paper.